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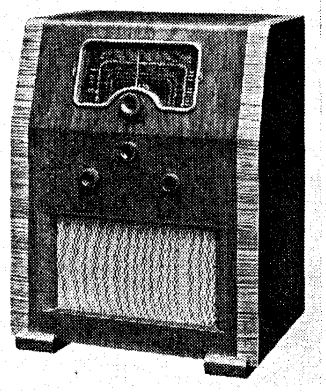
"TRADER" SERVICE SHEET

368

ALBA 820, 620, 670 AND 725 (AC)



The Alba 820.

SHORT-WAVE ranges of 12·5-32 m (referred to below as SW1) and 28-85 m are covered by the Alba 820 4-valve (plus rectifier) AC 4-band superhet.

Identical chassis are fitted in the 620 armchair console and the 670 console, while the chassis of the 725 radio-gramophone is very similar, the differences being explained under "725 Modifications."

It should be noted that there are AC/DC models bearing the same model numbers but this *Service Sheet* covers only the AC models and was prepared on an 820 table receiver.

Release date for 620, 670 *and* 820 (*AC*) : *March*, 1938.

Release date for 725 (*AC*) : *July*, 1938.

CIRCUIT DESCRIPTION

Aerial input on MW and LW is via SW coupling coils **L9, L10** and MW and LW coupling coils **L1, L2** to inductively-coupled band-pass filter. Primary coils **L3, L4** are tuned by **C20**; secondaries **L13, L14** by **C23**; coupling by coils **L5, L6, L7, L8.** On SW, input is via coupling coils **L9** (SW1) and **L10** (SW2) to single tuned circuits **L11, C23** (SW1) and **L12, C23** (SW2).

First valve (**V1, Mullard metallised TH4**) is a triode hexode operating as frequency changer with internal coupling. Triode oscillator grid coils **L15** (SW1), **L16** (SW2), **L17** (MW) and **L18** (LW) are tuned by **C24**; parallel trimming by **C26** (SW2), **C27** (MW) and **C28** (LW); series tracking by **C5** (MW) and **C25** (LW). Reaction by coils **L19** (SW1), **L20** (SW2), **L21** (MW) and **L22** (LW).

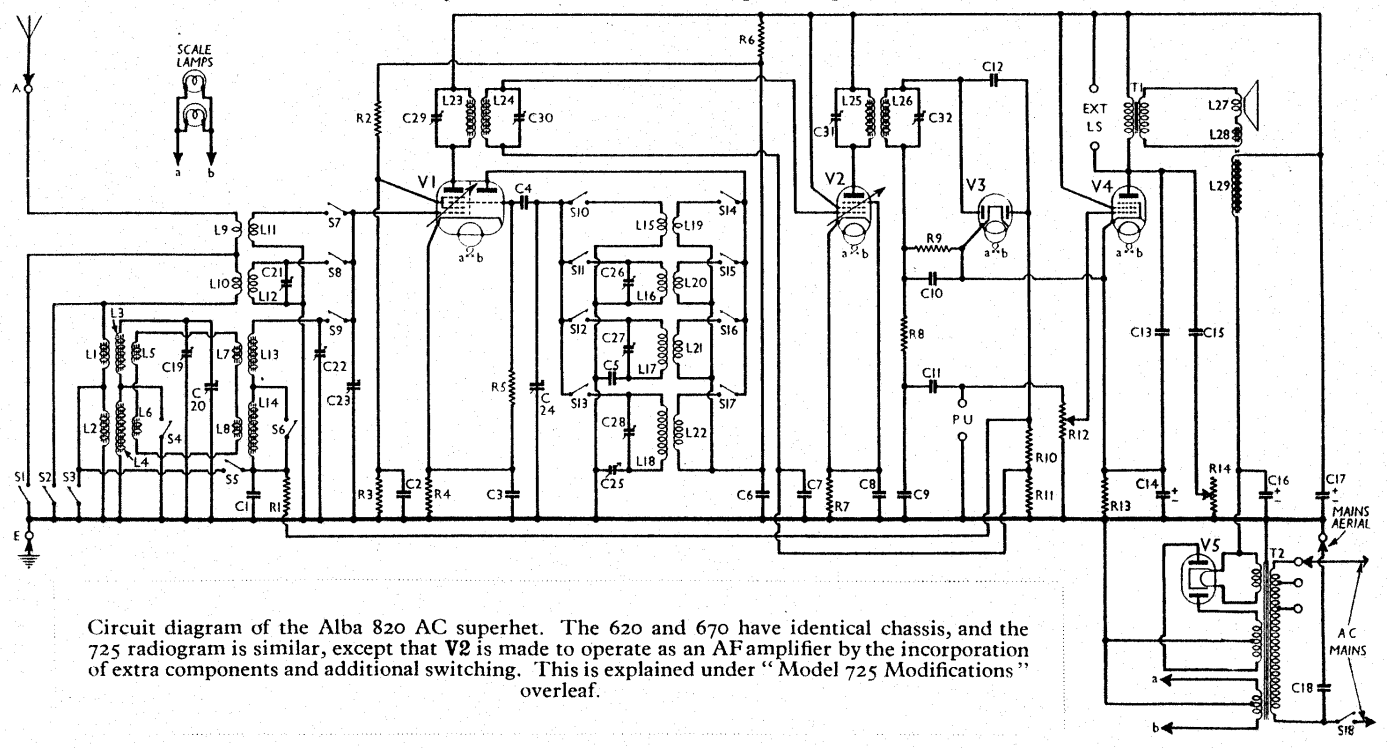
Second valve (**V2, Mullard metallised VP4B**) is a variable-mu RF pentode operating as intermediate frequency amplifier with tuned-primary tuned-secondary iron cored transformer couplings **C29, L23, L24, C30** and **C31, L25, L26, C32.**

Intermediate frequency 117·5 KC/S.

Diode second detector is part of separate double diode (**V3, Mullard metallised 2D4A**). Audio frequency component in rectified output is developed across load resistance **R9** and passed via IF stopper **R8,** AF coupling condenser **C11** and manual volume control **R12** to CG of pentode output valve (**V4, Mullard Pen A4**). IF filtering by **C10, R8** and **C9.** Provision for connection of gramophone pick-up across **R12.** Fixed tone correction by **C13,** and variable tone control by **C15, R14,** both in anode circuit. Provision for connection of high impedance external speaker by terminals across primary of internal speaker input transformer **T1.**

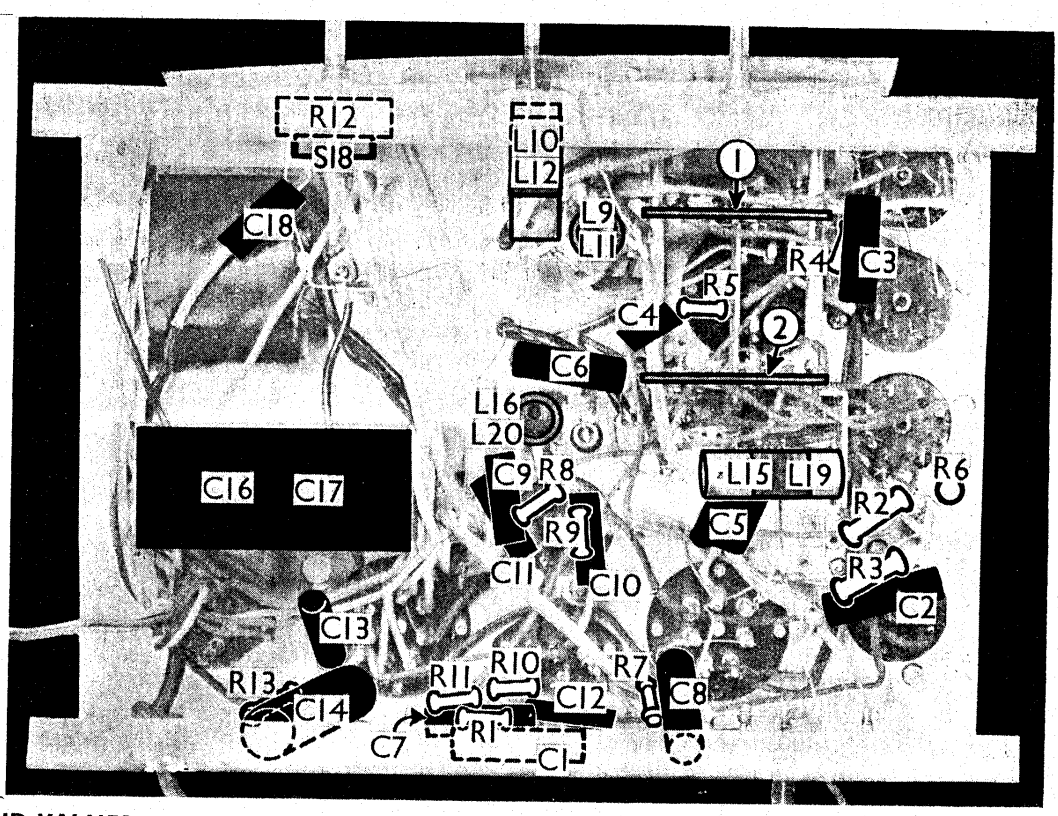
Second diode of **V3,** fed from **L26** via **C12,** provides DC potentials which are developed across load resistances **R10, R11** and fed back through decoupling circuits as GB to FC (except on the two SW bands) and IF valves, giving automatic volume control. Delay voltage is obtained from drop along **R13** in **V4** cathode circuit.

HT current is supplied by IHC full-wave rectifying valve (**V5, Mullard IW4/350**). Smoothing by speaker field **L29** and dry electrolytic condensers **C16, C17.** The mains aerial plug, when inserted in the aerial socket, couples one side of the mains to the aerial via **C18.** When it is not being used as such the plug is inserted in an extra earth socket, so that **C18** becomes a mains RF by-pass condenser.



Circuit diagram of the Alba 820 AC superhet. The 620 and 670 have identical chassis, and the 725 radiogram is similar, except that **V2** is made to operate as an AF amplifier by the incorporation of extra components and additional switching. This is explained under "Model 725 Modifications" overleaf.

Under-chassis view. Diagrams of the two switch units are overleaf. The tone control components **R14, C15** are wired to the speaker input panel inside the cabinet, and are therefore not shown in this or the plan chassis view.



COMPONENTS AND VALUES

	RESISTANCES	Values (ohms)
R1	V1 hexode CG decoupling ..	1,000,000
R2	V1 SG HT feed potential divider resistances ..	10,000
R3		25,000
R4	V1 fixed GB resistance ..	200
R5	V1 osc. CG resistance ..	25,000
R6	V1 SG and osc. anode HT feed	13,000
R7	V2 fixed GB resistance ..	150
R8	IF stopper	50,000
R9	V3 signal diode load ..	500,000
R10	V3 AVC diode load resistances	500,000
R11		500,000
R12	Manual volume control ..	500,000
R13	V4 GB and AVC delay ..	150
R14	Variable tone control ..	50,000

	CONDENSERS	Values (μF)
C1	V1 hexode CG decoupling ..	0·1
C2	V1 SG decoupling	0·1
C3	V1 cathode by-pass ..	0·1
C4	V1 osc. CG condenser ..	0·0001
C5	Osc. circuit MW tracker ..	0·002
C6	V1 osc. anode decoupling ..	0·1
C7	V2 CG decoupling	0·1
C8	V2 cathode by-pass ..	0·1
C9	IF by-pass condensers ..	0·0002
C10		0·0002
C11	AF coupling to V4	0·005
C12	Coupling to V3 AVC diode ..	0·0002
C13	Fixed tone corrector ..	0·005
C14*	V4 cathode by-pass	25·0
C15	Part of variable tone control	0·05
C16*	HT smoothing	6·0
C17*		6·0
C18	Mains aerial coupling ..	0·0001
C19‡	Band-pass pri. MW trimmer	0·00003
C20‡	Band-pass primary tuning ..	—
C21‡	Aerial SW2 trimmer ..	0·00003
C22‡	Band-pass sec. MW trimmer	0·00003
C23‡	SW aerial and band-pass secondary tuning	—
C24‡	Oscillator circuit tuning ..	—
C25‡	Osc. circuit LW tracker ..	0·0007
C26‡	Osc. circuit SW2 trimmer ..	0·00003
C27‡	Osc. circuit MW trimmer ..	0·00003

Continued in next column

	CONDENSERS (*Continued*)	Values (μF)
C28‡	Osc. circuit LW trimmer ..	0·00003
C29‡	1st IF trans. pri. tuning ..	—
C30‡	1st IF trans. sec. tuning ..	—
C31‡	2nd IF trans. pri. tuning ..	—
C32‡	2nd IF trans. sec. tuning ..	—

*Electrolytic. † Variable. ‡ Pre-set.

	OTHER COMPONENTS	Approx. Values (ohms)
L1	Aerial MW and LW coupling coils	60·0
L2		10·0
L3	Band-pass primary coils ..	1·6
L4		18·5
L5	Band-pass coupling coils, total	47·0
L6		
L7	Band-pass coupling coils, total	45·0
L8		
L9	Aerial SW1 coupling coil ..	0·1
L10	Aerial SW2 coupling coil ..	0·2
L11	Aerial SW1 tuning coil ..	Very low
L12	Aerial SW2 tuning coil ..	0·1
L13	Band-pass secondary coils ..	1·6
L14		21·0
L15	Osc. circuit SW1 tuning coil. .	0·05
L16	Osc. circuit SW2 tuning coil	0·1
L17	Osc. circuit MW tuning coil	2·5
L18	Osc. circuit LW tuning coil	13·0
L19	Oscillator SW1 reaction ..	17·0
L20	Oscillator SW2 reaction ..	0·4
L21	Oscillator MW reaction ..	44·0
L22	Oscillator LW reaction ..	87·0
L23	1st IF trans. Pri. ..	33·0
L24	Sec. ..	33·0
L25	2nd IF trans. Pri. ..	33·0
L26	Sec. ..	33·0
L27	Speaker speech coil	1·9
L28	Hum neutralising coil ..	0·1
L29	Speaker field coil	1,200·0
T1	Speaker input trans. Pri. ..	450·0
	Sec. ..	0·4
T2	Mains trans. Pri., total ..	24·0
	Heater sec. ..	0·05
	Rect. heat. sec..	0·1
	HT sec., total ..	470·0
S1-17	Waveband switches ..	—
S18	Mains switch, ganged R12 ..	—

DISMANTLING THE SET

Removing Chassis.—Remove the two lowest knobs and the tuning knob (recessed screws) and the four bolts (with washers and rubber washers) holding the chassis to the shelf. The chassis can now be withdrawn from the cabinet to the extent of the speaker leads, which is sufficient for normal purposes.

If it is desired to free the chassis entirely, unsolder the speaker leads and *when replacing*, connect them as follows, noting that the tags are numbered :—F and 3 joined, red ; 1, black and one side of **C15** ; F, blue. The white lead and the yellow lead from the tone control go to the earthing tag on the speaker frame.

Removing Speaker.—The speaker can be removed from the cabinet by unsoldering the leads and removing the nuts, washers and rubber washers from the four screws holding it to the sub-baffle.

When replacing, see that there is a rubber washer on each of the fixing screws, between the sub-baffle and the speaker, place the transformer on the right and connect the leads as above.

VALVE ANALYSIS

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 TH4	250	2·4	52	3·0
	Oscillator 112	5·0		
V2 VP4B	250	8·0	250	3·1
V3 2D4A	—	—	—	—
V4 PenA4	236	38·0	250	6·6
V5 IW4/350	310†	—	—	—

† Each anode, AC.

Valve voltages and currents given in the table above are those measured in our receiver when it was operating on mains

of 225 V, using the 220 V tapping on the mains transformer. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but there was no signal input.

Voltages were measured on the 400 V scale of a model 7 Universal Avometer, chassis being negative.

GENERAL NOTES

Switches.—**S1-S17** are the waveband switches, ganged in two rotary units beneath the chassis. These are indicated in our under-chassis view and are shown in detail in the diagrams in column 3, where they are drawn as seen from the front of the underside of the chassis. The table (column 2) gives the switch positions for the four control settings, starting from fully anti-clockwise. A dash indicates *open* and **C**, *closed*.

S18 is the QMB mains switch, ganged with the volume control **R12.**

Coils.—**L1-L6; L7, L8, L13, L14; L17, L18, L21, L22;** and the IF transformers **L23, L24** and **L25, L26** are in five screened units on the chassis deck, the last two containing their trimmers.

L9, L11; L10, L12; L15, L19 and **L16, L20** are in four unscreened tubular units beneath the chassis.

External Speaker.—Two terminals are provided on the internal speaker transformer panel for a high impedance (about 8,000 Ω) external speaker.

Scale Lamps.—These are two Osram MES types, rated at 6·2 V, 0·3 A.

Condensers C16, C17. These are two 6 μF dry electrolytics in a single carton beneath the chassis, having a common negative (black) lead. The red lead is the positive of **C16** and the yellow the positive of **C17.**

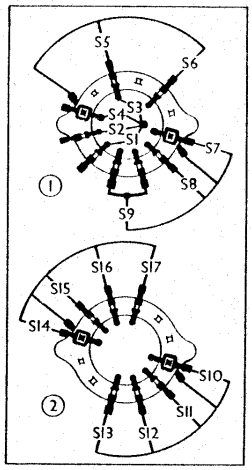
Chassis Divergencies.—Our chassis differs in several respects from the makers' original diagram. This shows **R5** returned to chassis and no tone control circuit. The tone control components **C15, R14** are wired inside the cabinet to the speaker terminal strip and are therefore not shown in our chassis illustrations.

The values of the coil resistances in our chassis differ from those given by the makers, so that any discrepancies here may not indicate a fault, but merely that slightly different coils are in use.

The same applies to the resistances of the mains transformer windings.

TABLE AND DIAGRAMS OF THE SWITCH UNITS

Switch	SW1	SW2	MW	LW
S1	C	–	–	–
S2	–	C	–	–
S3	–	–	C	–
S4	C	–	C	–
S5	C	–	–	–
S6	–	–	C	–
S7	C	–	–	–
S8	–	C	–	–
S9	–	–	C	C
S10	C	–	–	–
S11	–	C	–	–
S12	–	–	C	–
S13	–	–	–	C
S14	C	–	–	–
S15	–	C	–	–
S16	–	–	C	–
S17	–	–	–	C



Diagrams of the switch units, as seen from the front of the underside of the chassis.

MODEL 725 MODIFICATIONS

In the radiogram model 725 **V2** is switched to provide AF amplification for the pick-up. The modifications are as follows.

One pick-up socket goes to chassis, while the other goes to a fixed contact on an extra switch bank. The bottom of **L24** is disconnected from the AVC line and taken to the moving contact of the switch. The AVC line goes to four other fixed contacts of this switch. In the SW1 SW2, MW and LW positions, **L24** is connected to the AVC line, while in the gram position it is connected to the upper pick-up socket. The pick-up is thus fed into the grid circuit of **V2.**

In the anode circuit of **V2,** between the top of **L25** and the HT line a 5,000 Ω load resistance is inserted. The junction of **L25** and this resistance goes to one side of a 0·002 μF by-pass condenser, the other side of which goes to chassis. The junction of **L25** and the load resistance also goes to a 0·005 μF AF coupling condenser, the other side of which goes to one fixed contact of another rotary switch.

The junction of **C11** and **R12** is broken, and **R12** is taken to the moving contact of this second rotary switch. **C11** is taken to four fixed contacts of this switch. On SW1, SW2, MW and LW, **C11** is thus connected to **R12** as in our diagram, while on gram the AF coupling condenser goes to **R12, C11** being disconnected, and so muting radio.

CIRCUIT ALIGNMENT

IF Stages.—Connect signal generator between control grid (top cap) of **V1** and chassis, and feed in a 117·5 KC/S signal, with the receiver switched to MW. Now adjust **C32, C31, C30** and **C29** in turn for maximum output, reducing the input progressively as the circuits come into alignment. Re-check these settings.

RF and Oscillator Stages.—See that the scale pointer is horizontal when the gang is at maximum. If it is not, adjust it by means of the pointer clip on the drive spindle. The volume control should be set at maximum, and the signal generator connected to the **A** and **E** sockets.

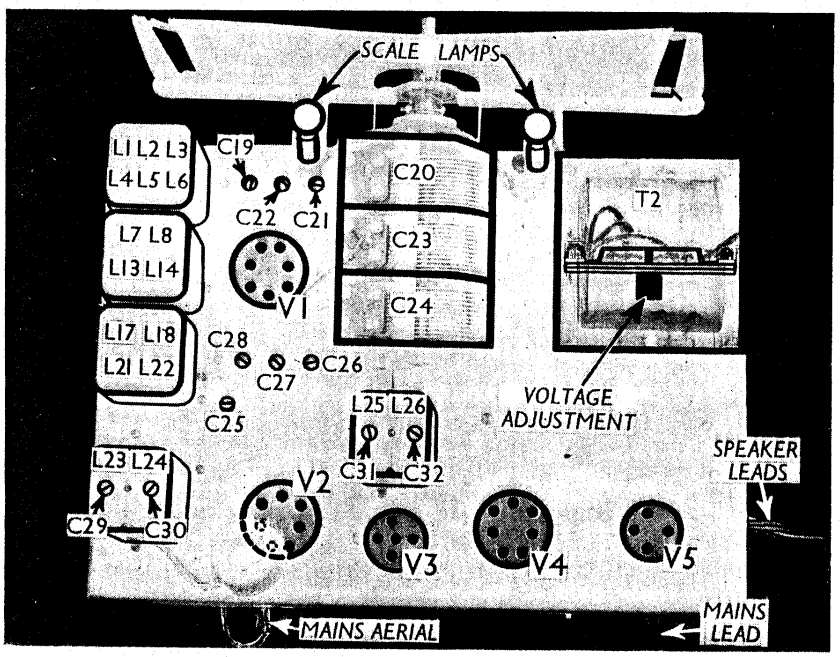
MW.—Switch set to MW, tune to 250 m on scale, feed in a 250 m (1,200 KC/S) signal, and adjust **C27,** then **C22** and **C19,** for maximum output.

LW.—Switch set to LW, tune to 1,200 m on scale, feed in a 1,200 m (250 KC/S) signal, and adjust **C28** for maximum output, rocking the gang for optimum results.

Feed in a 1,900 m (157 KC/S) signal, tune it in, and adjust **C25** for maximum output, while rocking the gang.

SW2.—Switch set to SW2 (28-85 m), tune to 31 m on scale and feed in a 31 m (9·67 MC/S) signal. Adjust **C26** for maximum output, choosing the peak obtained with **C26** nearest its minimum position. Now adjust **C21** for maximum output.

SW1.—No alignment adjustments are possible on this band.



Plan view of the chassis. Note the six trimmers and the tracker which are adjustable through holes in the chassis deck.

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